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# Yield and composition of lucerne stands in Central Otago after different winter grazing and weed control treatments

Mart-Marie Roux, Sarah Leask & Derrick Moot



New Zealand's specialist land-based university

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## Note:

This presentation was made by Prof. Derrick Moot on 5 Nov 2014 in Alexandra at the New Zealand Grassland Association Annual Conference.

It is associated with the following scientific publication:

Roux, M., Leask, S. K. and Moot, D. J. 2014. [Yield and composition of lucerne stands in Central Otago after different winter grazing and weed control treatments.](#) *Proceedings of the New Zealand Grassland Association*, **76**, 89-96.

# Objectives

- Is a glyphosate/atrazine combination effective for weed control?
- Does it cause phytotoxicity damage to lucerne?
- Can peak lucerne production be changed by winter herbicide and/or winter grazing management?

# The experiment

- On-farm at Hills Creek (Central Otago)
- Dryland, optimum soil pH
- 3 year old 'Kaituna' lucerne stand
- Clean-up graze on 12 June 2012

# The experiment

## Strip plot design (4 reps)

- 3 grazing dates

(6 Sept, 2 Oct, 14 Nov)

- 4 herbicide spray dates

(Unsprayed control, 3 Jul, 22 Aug, 18 Sept)

Glyphomax XRT 480 – 960 g ai/ha

Nu-trazine 900 DF – 960 g ai/ha

# Strip plot design

## Grazing date

Herbicide  
application

Control

22-Aug

03-Jul

18-Sep

06-Sep

14-Nov

02-Oct

1	5	9
2	6	10
3	7	11
4	8	12

Rep 1

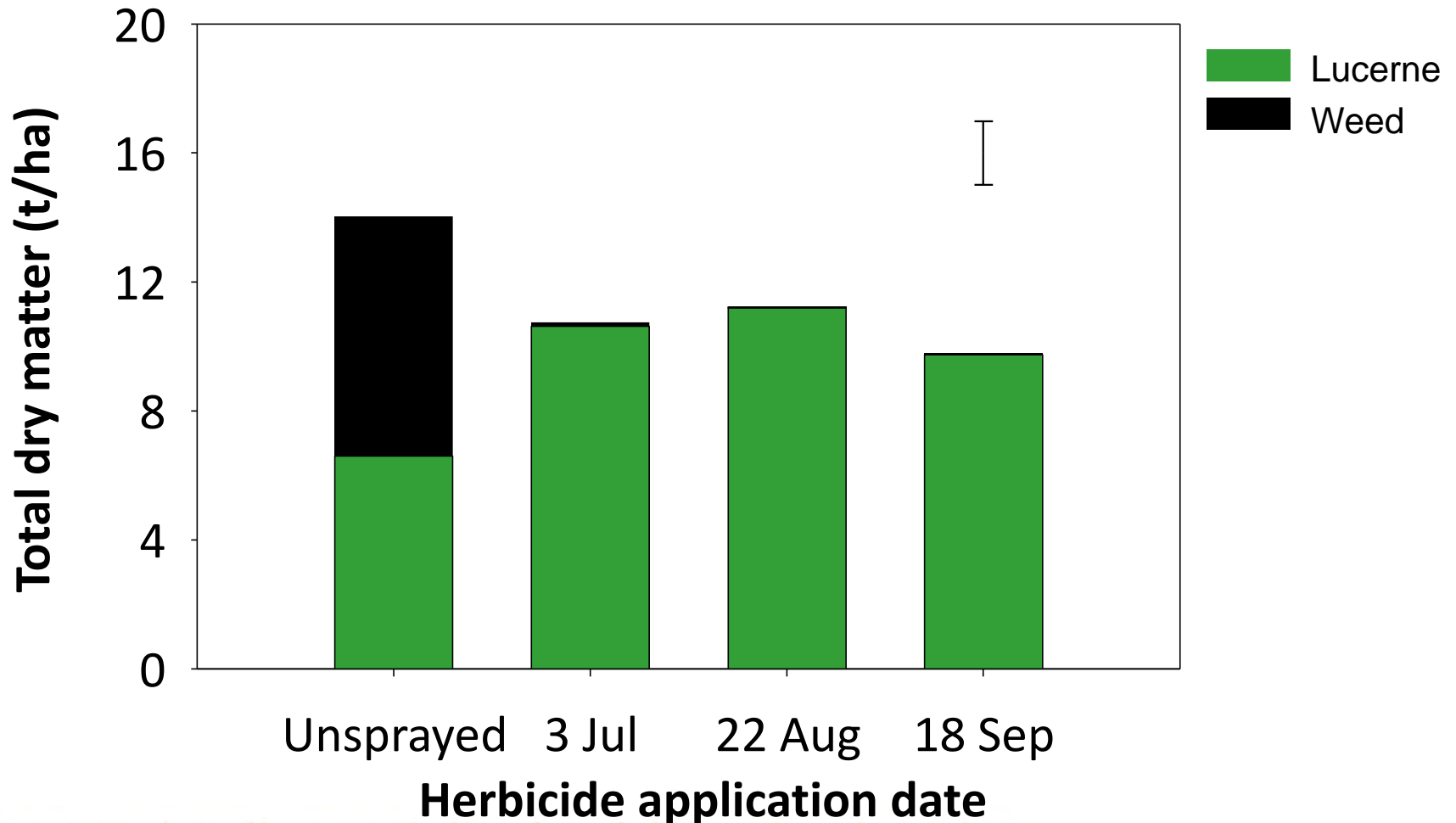


# Strip grazing maintained through growing season



# Total annual DM production

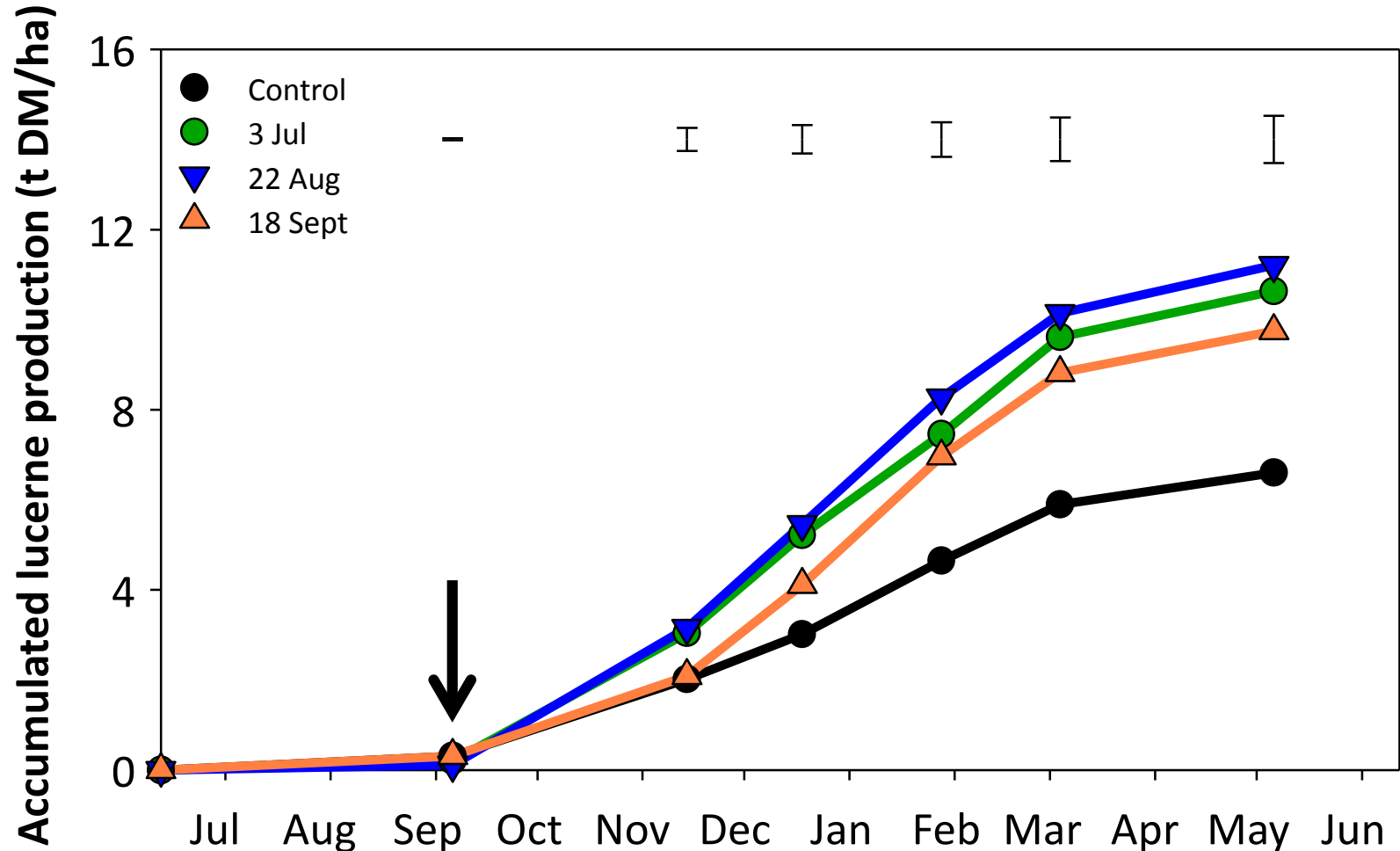
## - 6 September graze





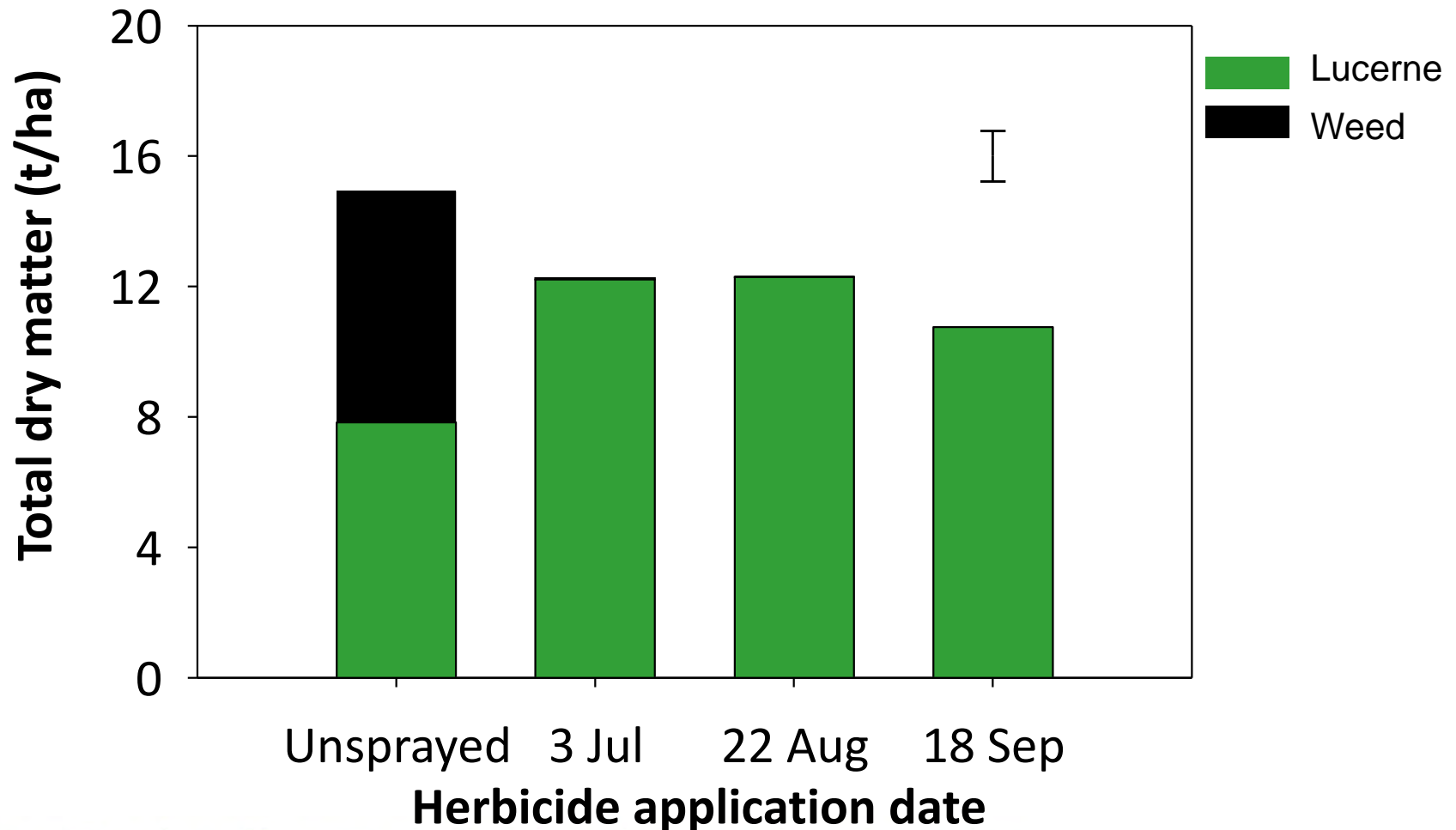
# Annual lucerne production

## - 6 September graze



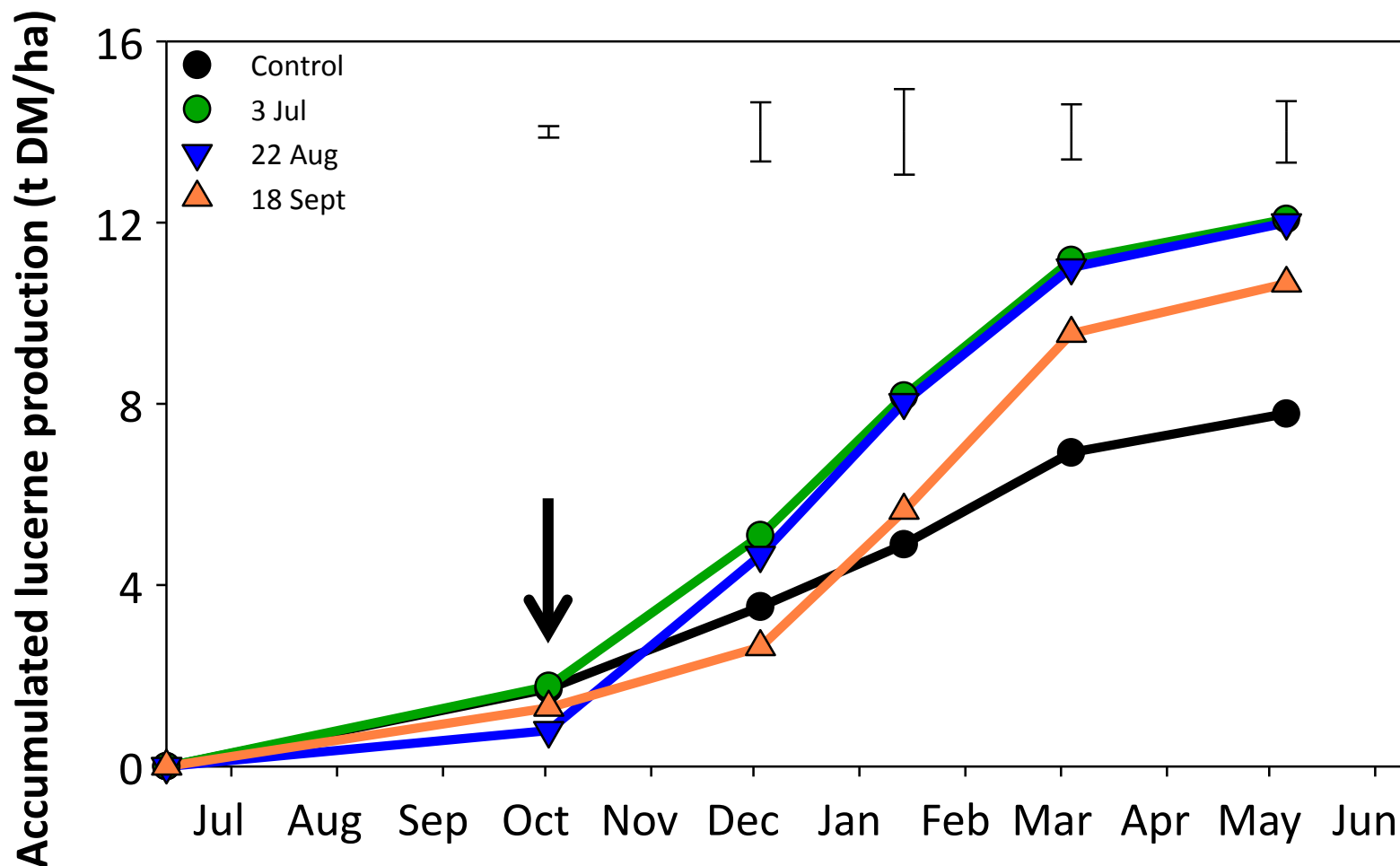
# Total annual DM production

## - 2 October graze



# Annual lucerne production

## - 2 October graze



# Unsprayed control for the 2 Oct grazing treatment

18 September 2012



13 November 2012



14 December 2012





# Unsprayed control for the 2 Oct grazing treatment (continued)

25 January 2013



3 March 2013

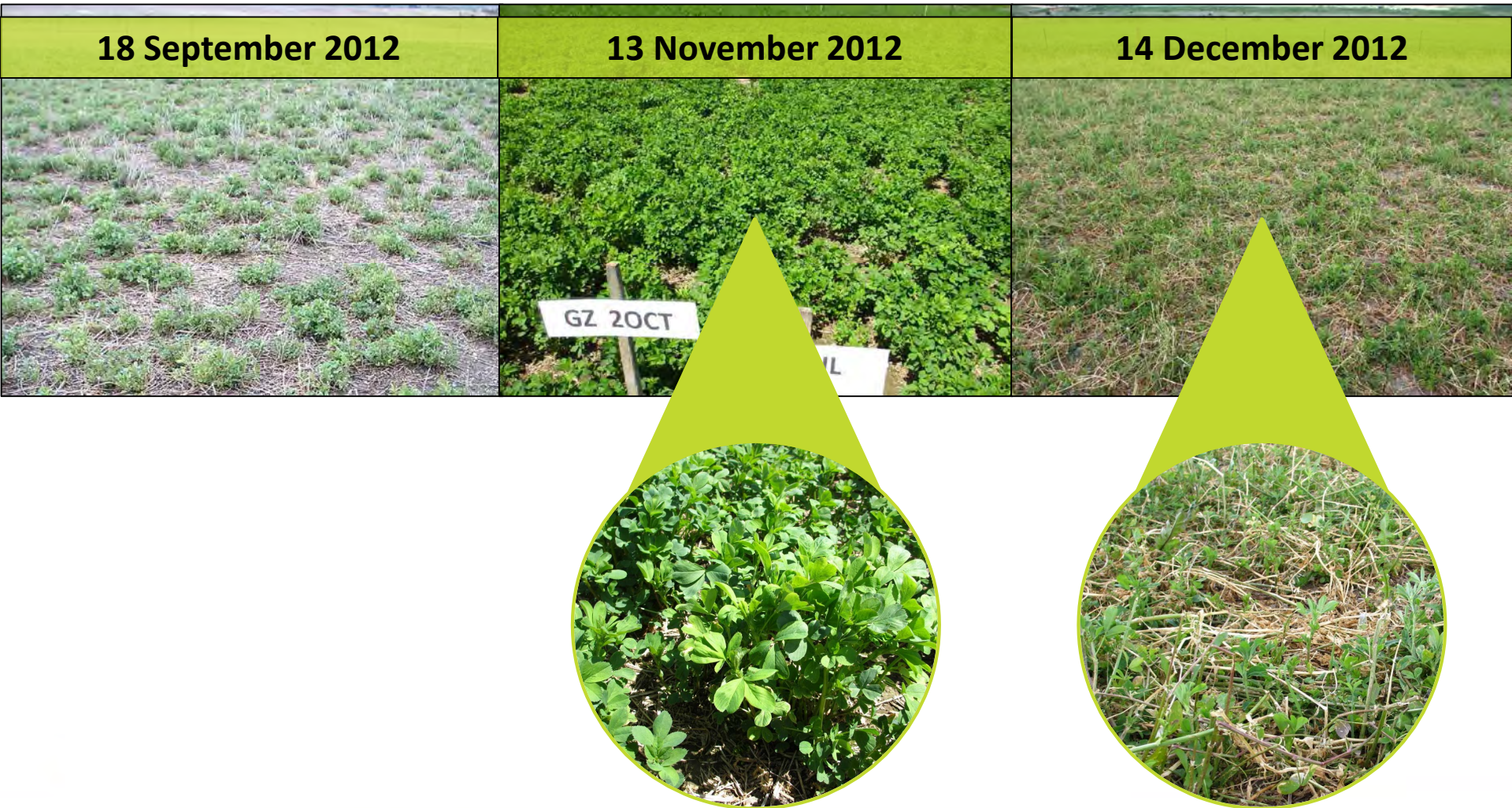


5 May 2013





# Plots sprayed 3 July and grazed on 2 October





# Plots sprayed 3 July and grazed on 2 October (continued)

25 January 2013



3 March 2013

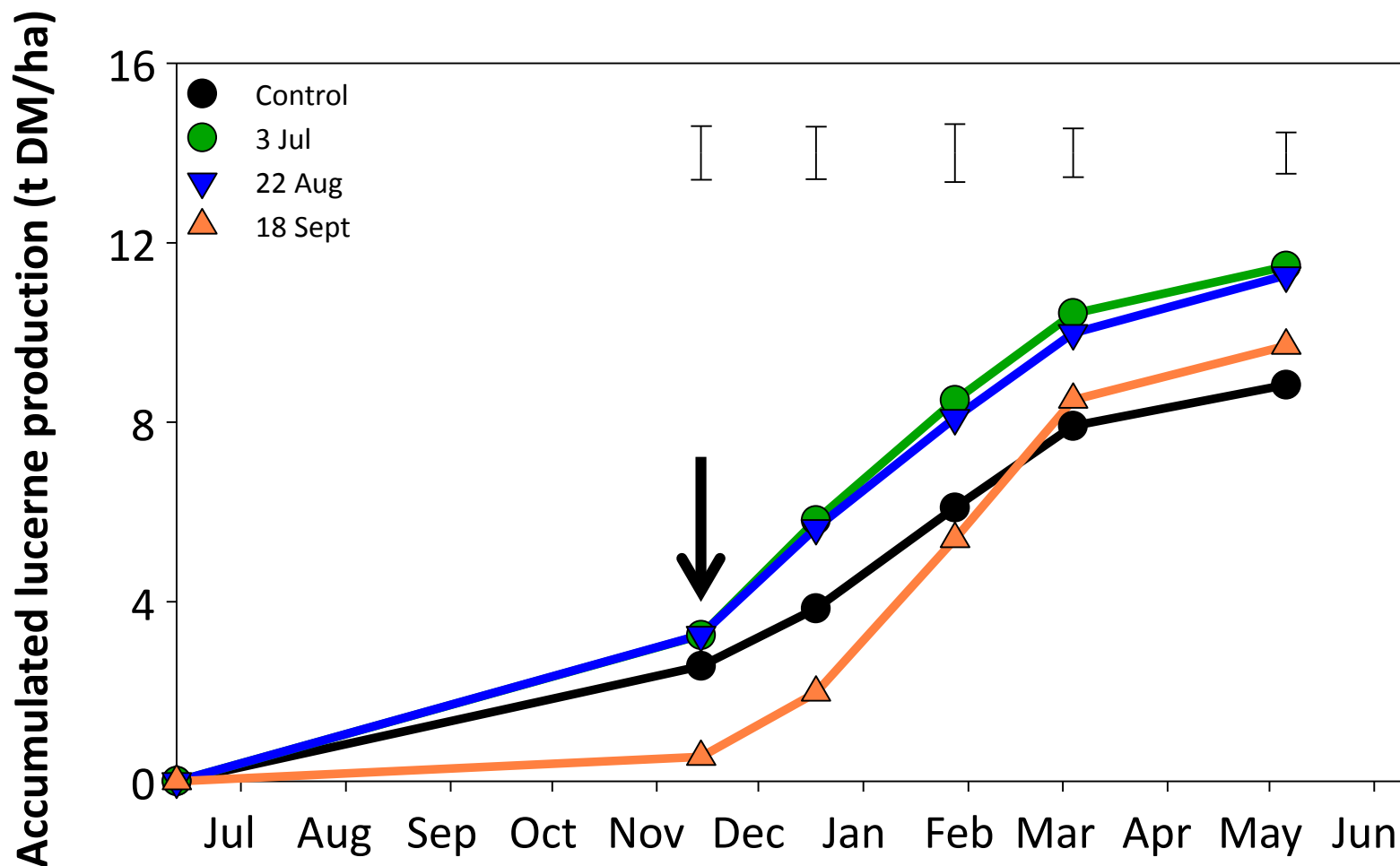


5 May 2012



# Annual lucerne production

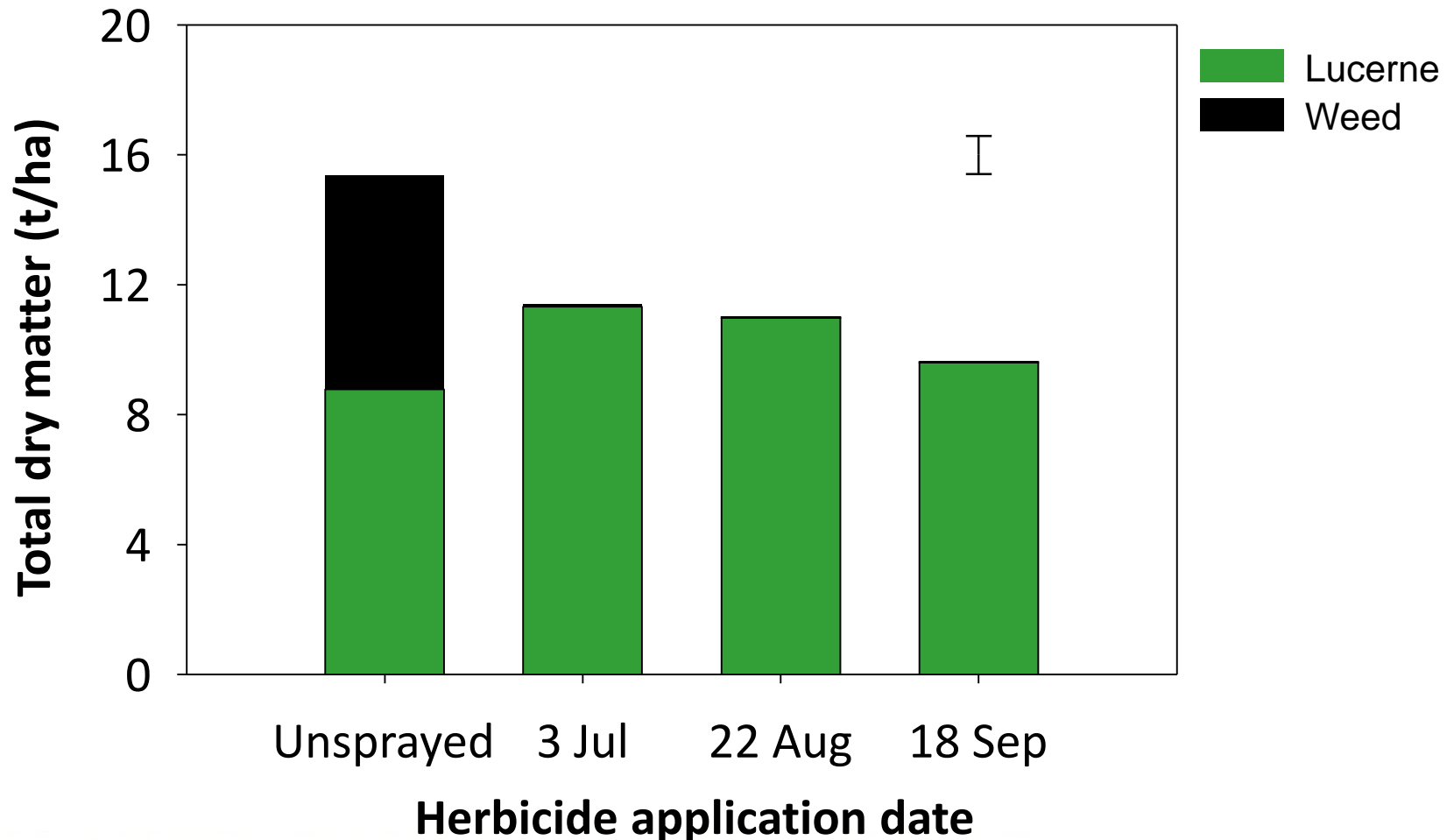
## - 14 November graze (hay crop)





# Total annual DM production

## - 14 November graze (hay crop)



# Days from 12 June to reach 4 t/ha lucerne DM

Application date	Grazing treatment		
	6 Sept	2 Oct	14 Nov
Control	220 <sub>a</sub> (18 Jan)	187 <sub>a</sub> (16 Dec)	191 <sub>b</sub> (20 Dec)
3 Jul	170 <sub>b</sub> (29 Nov)	156 <sub>c</sub> (15 Nov)	161 <sub>c</sub> (20 Nov)
22 Aug	168 <sub>b</sub> (27 Nov)	164 <sub>bc</sub> (23 Nov)	161 <sub>c</sub> (20 Nov)
18 Sept	186 <sub>b</sub> (15 Dec)	186 <sub>ab</sub> (15 Dec)	213 <sub>a</sub> (11 Jan)
SED	8.4	10.0	9.9

# Phytotoxicity scoring system

EWRS* score	Severity of symptoms	% of crop affected
1	Healthy plant	0
2	Very mild symptoms	0.1 – 2.0
3	Mild but clearly recognisable symptoms	2.1 – 5.0
4	More severe symptoms but no effect on yield	5.1 – 10.0
5	Reduction in yield expected – commercially unacceptable	10.1 – 18.0
6	Reduction in yield expected – commercially unacceptable	18.1 – 30.0
7	Reduction in yield expected – commercially unacceptable	30.1 – 45.0
8	Reduction in yield expected – commercially unacceptable	45.1 – 70.0
9	Heavy damage to total kill – commercially unacceptable	70.1 – 100

\* EWRS = European Weed Research Society

# Lucerne phytotoxicity scores

	Observation date								
	12 Oct		13 Nov			30 Nov	14 Dec		
	6 Sep	14 Nov	6 Sep	2 Oct	14 Nov	2 Oct	6 Sep	2 Oct	14 Nov
<i>Control</i>	1.0 <sub>c</sub>	1.0 <sub>c</sub>	1.0 <sub>b</sub>	1.0 <sub>c</sub>	1.0	1.0	1.0	1.0	1.0 <sub>b</sub>
<i>3 Jul</i>	1.0 <sub>c</sub>	1.0 <sub>c</sub>	1.0 <sub>b</sub>	1.3 <sub>c</sub>	1.0	1.0	1.0	1.0	1.0 <sub>b</sub>
<i>22 Aug</i>	4.8 <sub>b</sub>	7.3 <sub>b</sub>	1.8 <sub>b</sub>	2.5 <sub>b</sub>	1.0	1.0	1.0	1.0	1.0 <sub>b</sub>
<i>18 Sept</i>	7.4 <sub>a</sub>	9.0 <sub>a</sub>	4.3 <sub>a</sub>	9.0 <sub>a</sub>	9.0	9.0	1.3	9.0	8.9 <sub>a</sub>
SED	0.71	0.18	0.58	0.38					0.09



# Effect of herbicide on lucerne left ungrazed since 12 June

Photo: 18 Sept



Photo: 12 Oct





No herbicide symptoms apparent in January



24 Jan 2013

# Conclusions

- Glyphosate/atrazine successfully controlled weeds
- Damage to lucerne was short lived from September spraying of 100 kg DM/ha (5 cm)
- Dry matter accumulation was delayed by Sept grazing and spraying
- 6 July to 22 August gave highest lucerne yields.



# Acknowledgements

**Greenfields Ltd  
Hills Creek staff  
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# References

- Kroschel, J. 2001. A Technical Manual for Parasitic Weed Research and Extension. Kluwer Academic Publishers, Dordrecht, The Netherlands. 256 pp.